CLASSIFICATION CONFIDENTIAL - SECURITY INFOR

CENTRAL INTELLIGENCE AGENCY REPORT

INFORMATION REPORT

CD NO. 50X1-HUM

COUNTRY USSR (Armenian SSR)

DATE DISTR 2 October 1953

SUBJECT Ozernaya GES Hydroelectric Power Station at Sevan Lake

NO OF PAGES 10

PLACE ACQUIRED

NO. OF ENCLS. (LISTED BELOW) 50X1-HUM

DATE OF INFO.

SUPPLEMENT TO REPORT NO.

THIS IS UNEVALUATED INFORMATION 50X1-HUM

1. The Ozernaya GES Hydroelectric Power Station was located at the western tip of Sevan (Gokcha) Lake, north of Sevan (40°32'N/44°56'E). The lake was about 75 km long and 30 to 45 km wide.[1] 50X1-HUM a railroad line running from Yerevan (40°11'N/44°30'E), via Sevan and Dilizhan (40°44'N/44°52'E), to Kirovakan (40°48'N/44°30'E) was under construction plans called for electrification of the railroad line. 50X1-HUM

2. The entire project of the Sevan-Zanga Cascade provided for the construction of seven hydroelectric power stations on the Zanga River from Sevan Lake as far as Yerevan. After completion of the entire project, all seven power plants were to be linked together in one network. The Ozernaya GES Hydroelectric Power Station, the first installation of the Cascade, was in operation in August 1949. Construction of the second installation was started in the summer of 1949. In the summer of 1948, the construction of a tunnel was started to control and dam the water for the third power plant.[2]

3. The total output of the seven power plants was scheduled to exceed that of the Dnepr Power Station and was to be used for the supply of, among others, Yerevan and Kirovakan with their rubber, aluminum, and carbide industries. The Ozernaya Power Station was equipped with two Swedish-made turbines. The turbines had an installed capacity of 21,200 kw each. They were operated alternately since the industries to be supplied were still under construction. A high tension transmission line led from the power plant to Yerevan; a second high tension line led to Kirovakan. 50X1-HUM

1. Comment. For location sketch of the Ozernaya GES Hydroelectric Power Station, see Annex 1 based on concordant information 50X1-HUM and a map with scale 1 : 200 000. It is known from other records that a railroad line, 58 km long, was under construction from Yerevan to Akhta (15 km southwest of Sevan) in mid-1948.

50X1-HUM

CLASSIFICATION CONFIDENTIAL

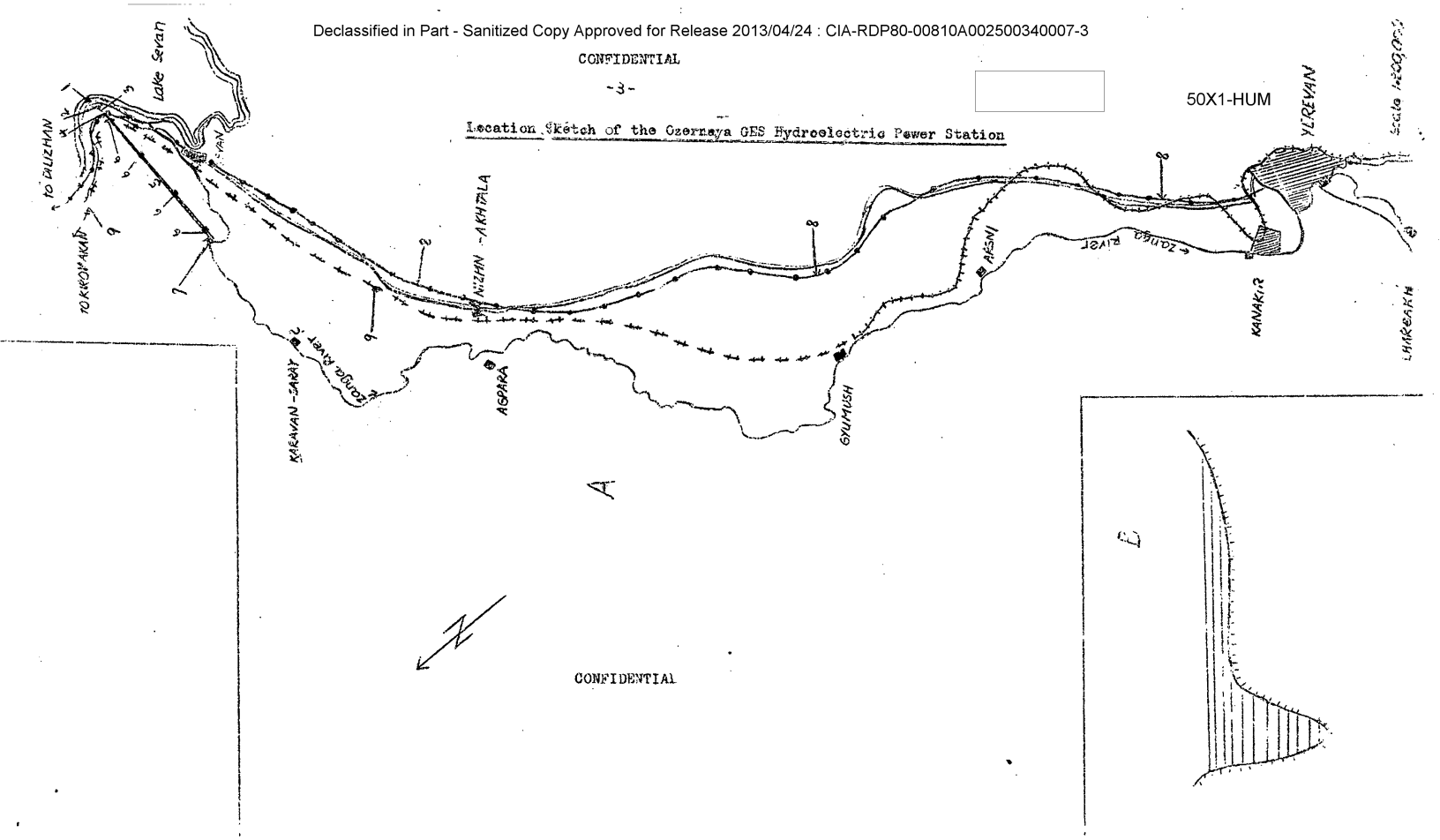
STATE	NAVY	NSA	DISTRIBUTION
ARMY	AIR	FBI	

50X1-HUM

2. [redacted] Comment. According to other records, the dam of the Ozernaya GES Hydroelectric Power Station, the first installation of the Sevan-Zanga Cascade, was completed in November 1948. The power plant was almost completed in February 1949. The second plant, to be built at Karavansaray between Sevan and Gyumush, 33 km southwest of Sevan, was still only projected in early 1949. The Gyumush GES Power Plant was the third installation. In March 1948, a reservoir had been built for this plant at Agpara (N 40-30, E 44-44) near Akhta. The water was conducted from the reservoir through an open canal and a tunnel, 11 km long, to the Gyumush hydroelectric power station, falling from an altitude of 300 meters to the turbines of the plant. The Gyumush Hydroelectric Power Station, which will be the largest installation of the Cascade, was under construction in 1949 and was scheduled to be put into operation in 1950. The fourth hydroelectric power station to be built near Arsni, 14 km northeast of Kanakir, was also still only projected in February 1949. The fifth hydroelectric power station, the Kanakir GES, and the sixth hydroelectrical power station, the Yerevan GES, which were in operation before the war, were completely equipped with automatic controls by December 1950. The location of the seventh hydroelectric power station was, allegedly, to be Charbakh, 5 km southwest of Yerevan. The total capacity was scheduled to be 700,000 hp and the power supply about 2,500,000,000 kw hours per year. A long-distance transmission line, 60 km long, was under construction in the autumn of 1943. 50X1-HUM

50X1-HUM

Location Sketch of the Ozernaya GES Hydroelectric Power Station



Legend

A. Layout sketch:

1. Reservoir.

2. Surge tank.

3. Pressure tunnel.

4. Turbine shop.

5. Out flow tunnel, about 6.5 km long. The tunnel had reinforced concrete walls, 1 meter thick, and was 4.5 meters in diamter.

6. Vertical shafts to the tunnel base. The excavation of the outflow tunnel was advanced from here, from the pressure tunnel, and from the tunnel exit.

7. Tunnel exit. An open canal led from here to the Zanga River.

8. Probable source of the high tension line.

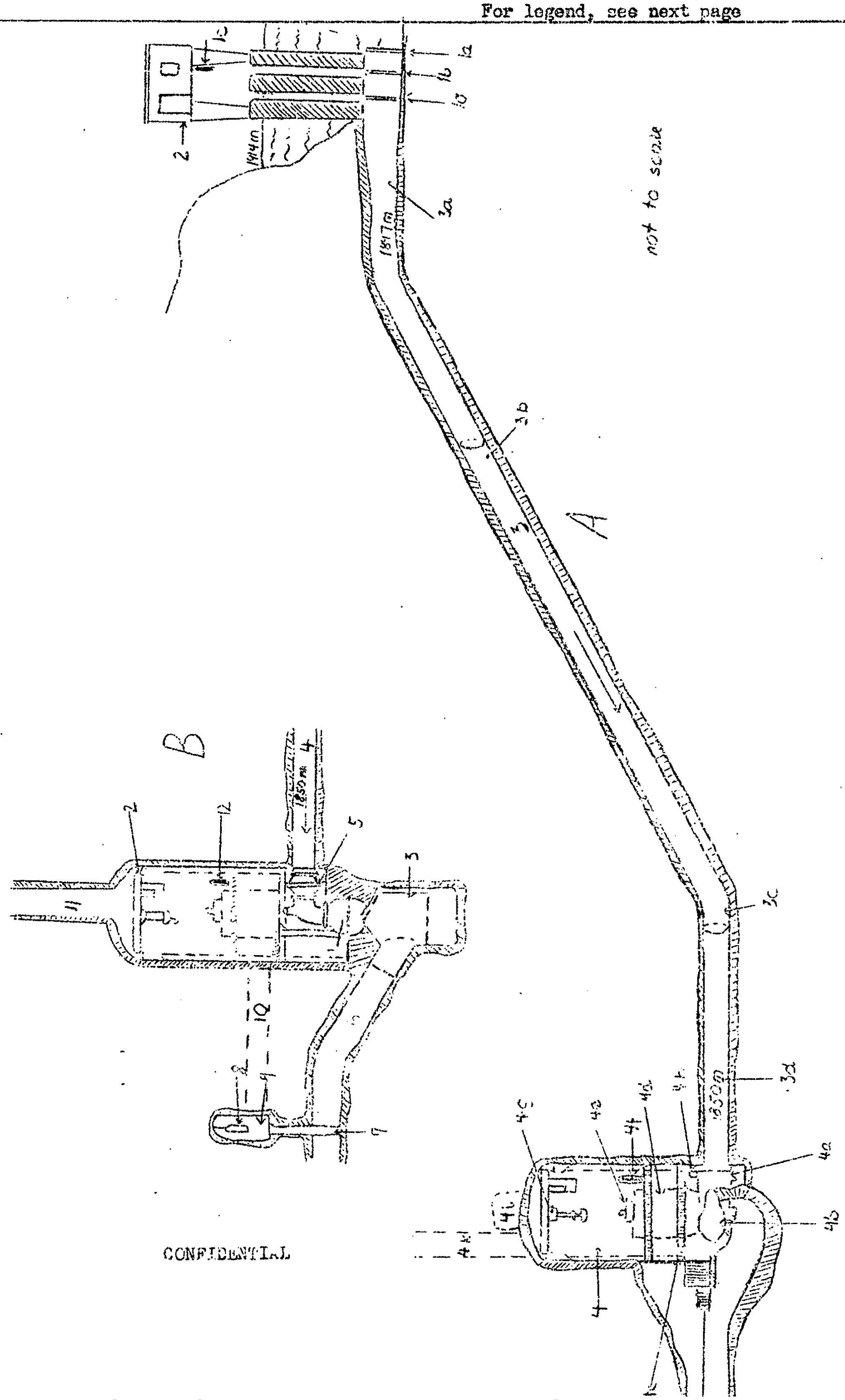
9. Railroad line under construction. Some sections were completed.

B. Cross section of Seven Lake:

The lake is about 1,930 meters above sea level, from 60 to 75 km long and 30 to 45 km wide. The removal of water by the power plants will lower the water level of the lake thus reducing the surface area and the volume of evaporation.

Longitudial Section of the Surge Tank, Pressure Tunnel and Turbine Shop of the Ozernaya GES Hydroelectric Power Station

For legend, see next page



Legend

A. Surge Tank, pressure tunnel, and turbine shop:

1. Inlet, 5 meters square, equipped with

   a. Rough grate, made of 120 mm rails

   b. Fine grate which could be replaced by a slide for shutting off the water

   c. Slide, weighing about 20 tons

   d. Second slide

2. Inlet tower with machine shop equipped with winches and motors for the operation of the slides and grates.

3. Pressure tunnel. The slant section had an inclination of 28°27'27'' degrees. The tunnel walls were lined with 12 mm gauge, ramified with 16 mm gauge steel plates.

   a. Beginning here, 1,897 meters above sea level, the inlet had a circular cross section of 4.4 meters in diameter.

   b. Inlet for the supply of the turbines. This was in preparation for the time when the lake level would have dropped.

   c. Inlet for supply of the turbines. Prepared for an additional fall of the lake level.

   d. At this point, 1,850 meters above sea level, the tunnel branched to the turbine installations and to the Janson installations.

4. Turbine shop

   a. Hydraulically operated throttle valve for sealing the water influx to the turbines.

   b. Turbines. Two suspended Francis turbines with vertical shaft. Each turbine had a capacity of 21,200 kw and 1,875 r.p.m. The turbines were manufactured by the NOHAB (Nordquist Holm A.B.) Swedish firm in Trollhaettan, Sweden. Turbines and generators were supported by a reinforced concrete structure. The installation had automatic controls, ventilation, and fire protection.

   c. Structural support (Lagerung) of the turbines.

   d. Two generators on the third floor, the generators originated with the Swedish ASEA firm.

   e. Exciter.

   f. Air mixing chamber equipped with pumps, control valves, and regulators for complete automatic control of the number of turbine revolutions. The required reserve pumps could be operated with three-phase as well as with D.C. electric motors.

g. Crane with a carrying capacity of 150 tons, running through the entire shop.

h. Janson installations.

i. Passage on top of the shop leading from the northern side to the assembly shaft (Montageschacht).

k. Shaft "O" with passenger elevator with an entry on each floor.

B. Janson installations:

Since a certain surplus of water was necessary for the operation of the turbines and overflow canal was required. However, the water power had to be reduced before it poured into the tunnel at a pressure of 6.5 atmospheres. This was done by the Janson installations.

1. Two Janson installations equipped with adjustable nozzles, and operated oil-hydraulically and pneumatically. The pressure was converted into speed by these installations.

2. Crane running through the entire shop.

3. Water breaking hole (Wasserloch) for deadening the whirl of the surplus water power.

4. Inlet to the Janson installations, 1,850 meters above sea level, with a diameter of 3.5 meters.

5. Ball valves, operated hydraulically and pneumatically, which could shut-off the two Janson installations.

6. Passage to the outflow tunnel.

7. Point for sealing the outlet by a slide.

8. Slide.

9. Chamber, from where the slide was operated by hand with pulley blocks.

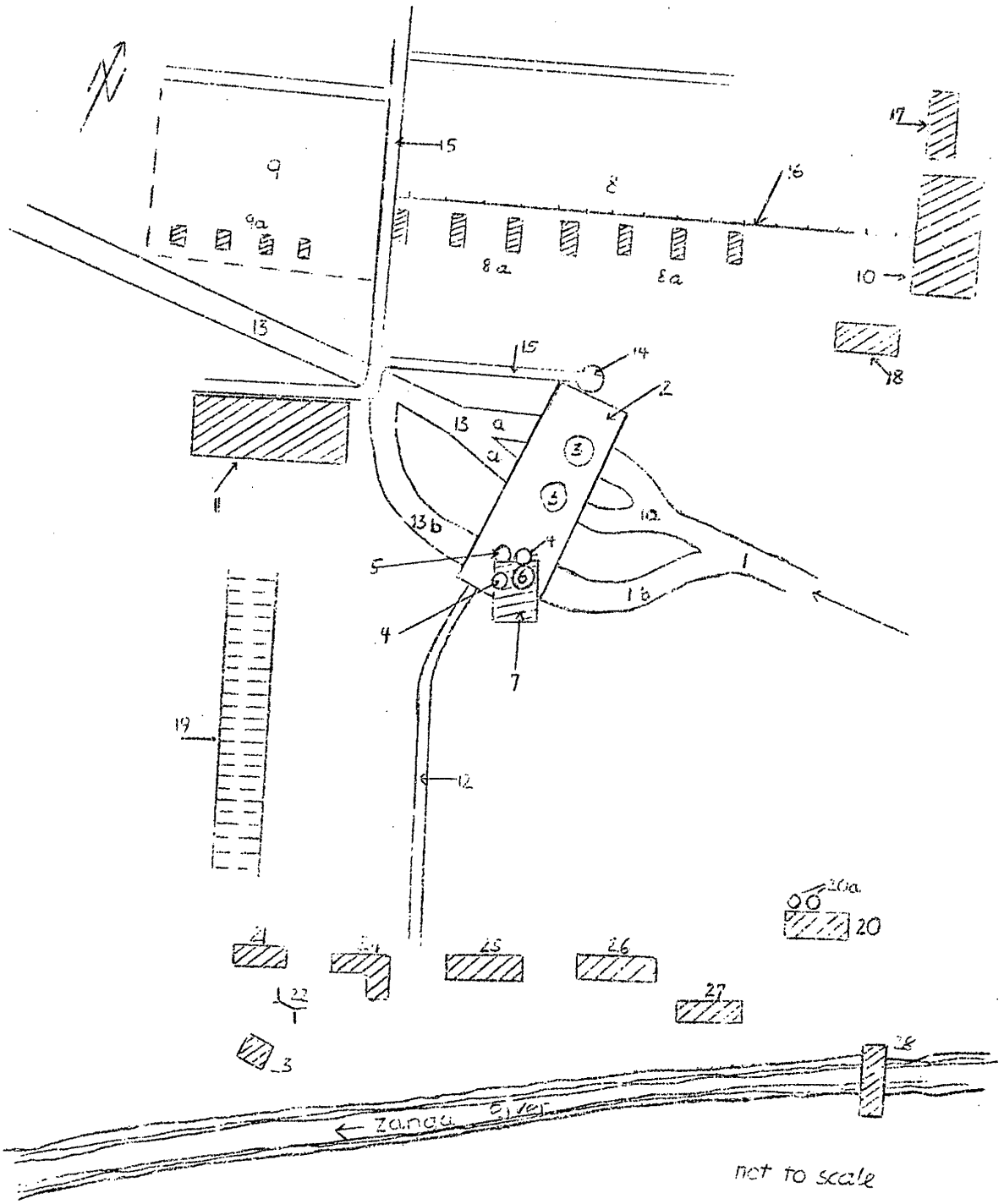
10. Passage from the turbine shop to the chamber.

11. Assembly shaft (Montageschacht) - (access to underground installation)

12. Two air mixing chambers, having parallel connections, with machinery operating the Janson installations, ball valves and throttle valves, by means of control boxes belonging to the individual slides.

Layout Sketch of the Ozernaya GES Hydroelectric Power Station

For legend, see next page



Legend

1. Pressure tunnel:

   a. two branches with an interior diameter of 4.40 meters, leading to the turbines.

   b. Branch leading to the Janson installations.

2. Turbine shop, 42 meters long, 16 meters wide, and 30 meters high.

3. Two Francis turbines.

4. Two Janson installations.

5. Water hole below the Janson installations.

6. Assembly shaft, 4.5 meters in diameter, leads to the turbine shop.

7. Crane shop, above-ground installation, built above the assembly shaft. A 40-ton crane, made by a firm in Finland, was in the crane shop. The crane was used for operations in the shaft. The shop was 15 meters long, 8 meters wide, and 14 meters high.

8. Transformer station, a 110-v installation.

   a. Seven transformers including one emergency transformer.

9. Open air control equipment, a 38-kv station, supplying electric power to consumers nearby.

   a. Four transformers.

10. Repair shop for the transformer installations, 15 meters high, equipped with a 50-ton crane. One transformer with oil weighed 40 tons.

11. Administrative building and switch house. Only the basement and the groundfloor were completed in October 1949. The storage battery rooms and the D.C. installation were housed in this structure. The D.C. installation was used for the operation of the D.C.-powered auxiliary and emergency machinery and pumps, and for emergency illumination.

12. Horizontal transportation tunnel, 2 to 3 meters wide, used during construction for transporting stones and concrete from the underground structure.

13. Outflow tunnel for the water coming from the turbine shop.

   a. Tunnel receiving the water from the turbines.

   b. Tunnel receiving the water from the Janson installations.

14. Vertical assembly shaft.

50X1-HUM

15. Cable conduits for current cables leading from the assembly shaft to the switch house, to the transformer station, and to the open-air control equipment. The conduits were 2.5 meters high and about 2 meters wide. Walls and ceiling were of reinforced concrete with a thickness ranging from 0.2 to 0.5 meters.

16. Railroad track, Soviet gauge, scheduled to be connected with projected railroad line. A special car on these tracks conveyed transformers to the transformer repair shop.

17. Small workshop.

18. Workshop with oil containers.

19. Staircase, under construction in October 1949.

20. Compressor room equipped, for the most part, with American-made compressors.

a. Air mixing chamber.

21. Cement storage room.

22. Rope winch for the tipper and the inclined elevator.

23. Rope winch house.

24. Cement depot with concrete mixing machine.

25. Forge and fitting shop.

26. Administration.

27. Carpenter's shop with wood dump.

28. Locks for barring the Zanga River, operated by hand.

The shaded items are above-ground installations.